A NOTE ON ASSOCIATION-TIME AND FEELING

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The free association experiment has been widely used for the study of emotional complexes[1]. Long lists of the effects caused by such complexes have been compiled. These effects include peculiarities as to kind of association and as to association-time. It seems, however, that little attention has yet been directed to the effect of simple feelings as opposed to complexes.

The one work we have found which studies directly in normal subjects the effect of simple feeling upon association-time is Birnbaum's[2] He used pleasant, unpleasant, and indifferent words as stimuli, and presented them to each of five hospital attendants. The pleasant words, of which there were twenty, included ' health,' ' riches;' the twenty unpleasant words included ' death,' ' enemy,' and the like; and the twenty indifferent words were such as ' hand,' ' house,' ' hat.' His results were negative. The median times for the associations evoked by each of the three groups of words were almost exactly the same; and this was found to be true for each of the five subjects.

The method employed in our own experiments was similar. In our preliminary series there were twenty words of each kind; these were chosen without a definite principle of classification as to the nature of the feelings they were expected to evoke, but it was not supposed that they would arouse any fundamental complexes. They were selected from a long list of nouns and adjectives we happened to have on hand, as follows:

Pleasant: blossom, banquet, lively, castle, slender, peaches, clean, lovely, romance, starry, dinner, darling, Cupid, flower, kindness, lily, wedding, candy, generous, honest.

Unpleasant: pimples, filthy, blindness, bankrupt, poverty, sulky, snobbish, prisoner, sneering, haggard, brutal, burglar,

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[1] See for a good resumé: Kohs, Samuel C. *Am. Jour. of Psychol.,* XXV, 1914. pp. 544-594.

[2] Birnbaum, Karl. *Monatsschr. f. Psychiat. u. Neurol,* XXXII, 1912, pp. 95-123, 194-220.

scowling, gloomy, drunkard, swindler, illness, cruel, selfish, ugly.

Indifferent: fibre, gravel, balance, cover, counter, kettle, measure, number, oven, sentence, ladder, squirrel, jackknife, basket, soap, reindeer, ribbon, knocker, evergreen, horse.

These sixty words were mixed in an irregular order, but so that not more than three of the same feeling-tone followed one another in immediate succession. The entire list was then presented with the usual instructions[3] for free associations to each of 17 women and 18 men. The subjects were divided between the two writers, both of whom acted as experimenters. The times were measured by a stop-watch.

The medians were computed for each of the three kinds of words; and the ratios were found for each subject of the 'pleasant' median to the 'indifferent' median $\left(\dfrac{P}{I}\right)$, and of the 'unpleasant' median to the 'indifferent' median $\left(\dfrac{U}{I}\right)$. The decision as to whether the pleasant or the indifferent words had the greater tendency to cause long association-times will depend upon the distribution of the subjects in regard to the ratio $\dfrac{P}{I}$. If this tends to exceed 1, then the pleasant words tend to cause longer association-times; if the opposite, the indifferent words tend to cause the longer times. Similarly the decision as to the unpleasant and the indifferent words will depend upon the distribution of the subjects with regard to the ratio $\dfrac{U}{I}$. In examining these distributions, however, it is obvious that a value of $\dfrac{U}{I}$ or $\dfrac{P}{I}$ equal, for example, to 1.5 $\left(\dfrac{3}{2}\right)$ would be balanced by one equal to 0.666 $\left(\dfrac{2}{3}\right)$ and not by one equal to 0.5; while a ratio of 0.5 $\left(\dfrac{1}{2}\right)$ would be balanced by one of 2.0; and so on. Now the logarithm of 0.666 is equal and opposite in sign to the logarithm of 1.5; similarly the logarithm of 0.5 is equal and opposite to the logarithm of 2.0, and so on. Therefore in plotting the distributions we have used the logarithms rather than the direct ratios themselves.

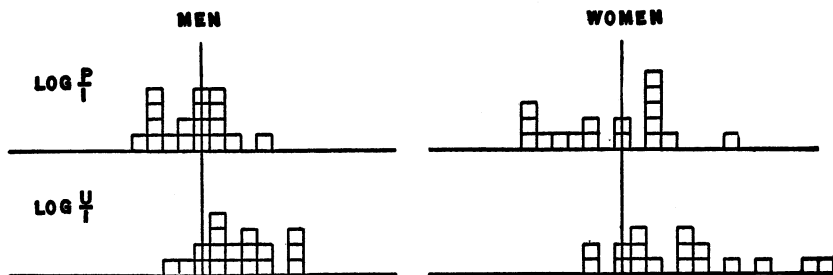[3] Whipple, G. M. *Manual of Mental and Physical Tests,* Part II. p. 55.

FIG. I

Figure 1 presents these plots for the men and women separately. Each square represents an individual, and its distance to the right or to the left of the centre line represents the value, plus or minus, of the logarithm of the ratio for that individual. Thus squares to the right of the centre line mean individuals with ratios greater than 1, squares to the left of the centre line individuals with ratios less than 1.

Examining first the two $\frac{P}{I}$ plots, we see no clear tendency in either case for $\frac{P}{I}$ to be more often either greater or less than 1. Turning, on the other hand, to the $\frac{U}{I}$ plots, we see a very decided tendency in both cases for $\frac{U}{I}$ to be greater than 1. Thus the pleasant words as stimuli were not' noticeably different from the indifferent words; but the unpleasant words showed a decided tendency to cause longer association-times.

This result contradicts Birnbaum's negative finding. A question arises, however, as to whether the longer times obtained for the unpleasant stimulus-words may not have been due to true complexes rather than to mere simple unpleasantness. Words like bankrupt, snobbish, drunkard, etc., may have been connected with subjective emotional histories. In such a case the results would merely point to the already well-established fact that complexes as such tend to lengthen association-times. They would not answer our original question as to the effect of simple feelings upon association-times.

In order to examine with greater precision this original question, a more carefully selected list of words was used. The words were chosen as appealing to several distinct depths of

feeling. Thus of thirty pleasant and thirty unpleasant words used, ten in each group referred to simple sense qualities only, ten or more of the pleasant to success, and ten of the unpleasant to failure; while the last ten of each group referred to love and home on the one hand, and to death and objects of disgust on the other. If it should appear that the simple unpleasant sense qualities were just as provocative of lengthened association-times as the words dealing with complexes, such as failure, death, and disgusting objects, we should conclude that unpleasantness *as such* really lengthens association-times.

TABLE I

Pleasant	Unpleasant	Indifferent
Sense	*Sense*	*Sense*
smooth	rough	still
fragrant	dusty	round
sunny	overcast	crooked
sparkling	dull	high
silvery	dingy	narrow
sweet	sour	swinging
airy	stuffy	tall
clean	dirty	bent
juicy	bitter	twisted
soft	chilly	wide
Success	*Failure*	
victory	defeat	motion
success	failure	incident
triumph	remorse	group
genius	fool	people
career	shame	occupation
reward	disgrace	occasion
achievement	guilt	change
praise	blame	individual
skill	stupidity	action
applause	scorn	feeling
Love	*Death*	
courtship	grief	business
wedding	funeral	meeting
lover	corpse	stamps
kiss	coffin	student
bridesmaids	undertaker	writing
Family-Home	*Disgust*	
sister	snake	hill
mother	sweat	water
family	worms	woods
parents	sores	stones
home	swill	road

Before presenting our results we may mention several further improvements in method. In each group of words, pleasant, unpleasant, and indifferent, the same proportion of nouns and adjectives was used, as was not the case in the previous experiment. This was to allow for the fact discovered by Crane[4] that adjectives, as such, tend to cause shorter association-times than do nouns. Also the proportion of concrete and abstract terms was kept as nearly as possible the same for each group of words. Table I presents the three groups in parallel columns. Words supposed to be of equal difficulty appear in the same horizontal line.

In presenting the lists, the words were mixed in the following ways. The words in each sub-group, such as 'sense,' 'success,' 'love,' 'disgust,' were evenly distributed over the entire list. The words of the three different feeling-tones were irregularly mixed, but so that not more than three words of the same feeling-tone followed each other in immediate succession. For not more than two subjects, however, was the exact order of presentation the same.

In order to eliminate the personal equations of the experimenters, an electric starter and stopper was used for the stop-watch.[5] This was connected with a falling shutter exposure apparatus and a lip-key. The stimulus-words were presented

TABLE II

TOTALS

30 pleasant, 30 unpleasant, and 30 indifferent words

Men				Women			
Name	P	U	I	Name	P	U	I
A........	.82	.81	.77	K........	1.17	1.40	1.30
B........	.99	1.26	1.15	L........	1.47	1.60	1.54
C........	1.07	1.23	1.13	M........	1.01	1.08	1.03
D........	.94	1.02	1.00	N........	.81	1.04	.91
E........	1.19	1.25	1.15	O........	1.29	1.47	1.38
F........	1.53	1.68	1.63	P........	1.41	1.70	1.43
G........	1.12	1.08	1.10	Q........	.98	1.08	.90
H........	1.53	1.63	1.56	R........	1.53	1.54	1.50
I........	1.15	1.20	1.08	S........	1.10	1.67	1.08
J........	1.70	1.48	1.55	T........	.87	1.30	.95

[4] Crane, H. W. *Psychological Monographs*, XVIII, 1915, whole No. 80.

[5] In the previous experiment, the times obtained by one of the experimenters averaged considerably shorter than those obtained by the other. The size of these personal equations led to the suspicion that the positive results obtained might have been due in part to unconscious influences exerted by the experimenters themselves.

TABLE II—*Continued*

SENSE

10 pleasant, 10 unpleasant, and 10 indifferent words

Men				Women			
Name	P	U	I	Name	P	U	I
A........	.90	.77	.60	K........	1.07	1.17	1.30
B........	.85	1.05	1.00	L........	1.30	1.50	1.45
C........	1.15	1.10	1.00	M........	.99	1.05	1.03
D........	1.00	.90	.80	N........	.75	1.00	.94
E........	1.00	1.30	1.03	O........	1.26	1.40	1.25
F........	1.40	1.33	1.40	P........	1.26	1.40	1.30
G........	1.17	1.05	1.02	Q........	.83	.95	.60
H........	1.43	1.60	1.55	R........	1.58	1.26	1.50
I........	.90	1.20	.99	S........	1.03	1.23	.80
J........	1.50	1.50	1.70	T........	.75	1.10	.85

SUCCESS-FAILURE

10 pleasant, 10 unpleasant, and 10 indifferent words

Men				Women			
Name	P	U	I	Name	P	U	I
A........	.83	.80	.87	K........	1.35	1.40	1.33
B........	1.05	1.35	1.25	L........	1.65	1.63	1.70
C........	1.10	1.40	1.50	M........	1.10	1.06	1.06
D........	1.05	1.20	1.33	N........	.93	1.10	.85
E........	1.15	1.30	1.14	O........	1.40	1.65	1.54
F........	2.10	1.90	1.77	P........	1.50	1.75	1.43
G........	1.18	1.07	1.03	Q........	1.00	1.00	.94
H........	1.75	1.60	1.80	R........	1.30	1.80	1.77
I........	1.40	1.53	1.18	S........	1.45	1.85	1.55
J........	1.83	1.50	1.90	T........	1.55	1.30	1.03

LOVE, FAMILY—DEATH, DISGUST

10 pleasant, 10 unpleasant, and 10 indifferent words

Men				Women			
Name	P	U	I	Name	P	U	I
A........	.75	.85	.90	K........	1.00	1.57	1.37
B........	1.00	1.30	1.17	L........	1.30	1.60	1.57
C........	.95	1.55	1.00	M........	.90	1.17	1.00
D........	.83	1.10	1.07	N........	.80	1.05	.85
E........	1.15	1.18	1.22	O........	1.20	1.45	1.40
F........	1.15	1.75	1.63	P........	1.37	2.00	1.70
G........	1.04	1.10	.98	Q........	1.03	1.55	1.20
H........	1.80	1.70	1.37	R........	1.40	1.60	1.23
I........	1.17	1.08	1.20	S........	1.00	1.60	1.20
J........	1.60	1.45	1.22	T........	.82	1.54	.87

visually, and the subject in reacting with associated words used the lip-key. Several practice words were given before the main series.

The median times for the 10 men and the 10 women experimented upon are shown in Table II. The ratios for these times, plotted as in the preceding case, are shown in Figure II.

The plots at the top show the complete results when the medians were computed from the total 30 words of each feeling-tone. It is clear at once that these data substantiate the findings of the previous experiment. The $\frac{P}{I}$ results indicate no clear tendency for shorter or longer times for pleasant words than for indifferent words. The $\frac{U}{I}$ results, on the other hand, for both men and women, point very decidedly to longer times for the unpleasant words.

Turning now to the partial results, and first to those for the words referring to sense qualities, we note decided evidence of longer times for the unpleasant words than for the indifferent, but no evidence of either consistently longer or shorter times for pleasant words than for indifferent ones. This is important. It solves the main problem we set out to investigate, for it proves that *simple unpleasantness as such lengthens association-time.*

Turning to the other partial results, we note first, that in the case of ' success ' and ' failure ' the evidence for longer times for the unpleasant words is lacking for the men, though present for the women. This fact seems to be but an accentuation of a characteristic common to all the results; an examination of each set of plots shows that in every case the evidence for longer times for the unpleasant words was more pronounced for the women than for the men.[6] This holds for the preceding experiment as much as for the present one.

Secondly, we note in the last group of plots a tendency for the women to have shorter times for the pleasant words than for the indifferent words. This may have been the result of mere chance, or it may point to a real though very slight tendency for pleasant words to cause shorter times than the indifferent words. In fact a closer examination of the $\frac{P}{I}$ plots lends some support to the latter alternative, at least in the

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[6] In this connection we may note that Haggerty and Kempf (*Amer. Jour. of Psychol.,* XXIV, 1913, pp. 414-425), found a greater tendency for suppression and substitution among women than among men.
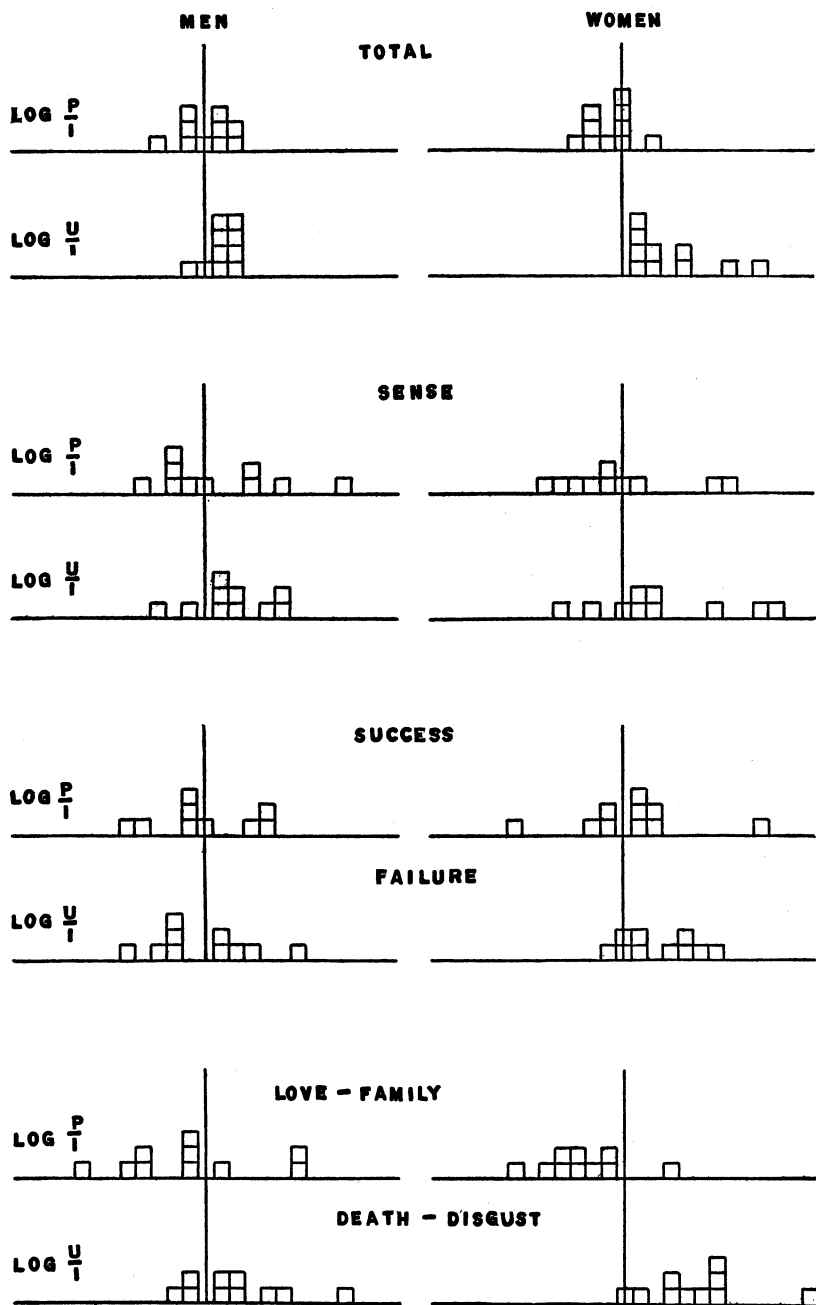
FIG. 2

case of the women. The evidence in all the cases, however, is very slight. It can be considered only as suggesting a fruitful problem for further investigation, not as indicative of an established fact.

To sum up: 1. Names of simple but unpleasant sense qualities, used as stimuli, tend to lengthen association-times quite as much as do unpleasant words of deeper emotional significance. 2. Women show the tendency to be affected by unpleasant stimulus-words more than do men. 3. There is evidence, in the case of the women, to suggest that pleasant stimulus-words may tend to cause shorter association-times than those caused by indifferent stimulus-words. The evidence for this point, however, is slight.